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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,926	06/29/2006	Gianni Ceccherini	72NP154563	2396
53082	7590	02/20/2009		
General Electric Company GE Global Patent Operation PO Box 861 2 Corporate Drive, Suite 648 Shelton, CT 06484			EXAMINER WONGWIAN, PHUTTHIWAT	
			ART UNIT 3741	PAPER NUMBER
			NOTIFICATION DATE 02/20/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gpo.mail@ge.com  
allyson.camaroli@ge.com

**Office Action Summary****Application No.**

10/596,926

**Applicant(s)**

CECCHERINI ET AL.

**Examiner**

PHUTTHIWAT WONGWAN

**Art Unit**

3741

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. This office action is responsive to the amendment filed on 12/12/2008. As directed by the amendment, claims 1-15 and 18 are currently pending in this application.

### *Response to Arguments*

2. Applicant's arguments, see arguments/remarks page 1, filed 12/12/2008, with respect to 112, second paragraph rejection of claims 6, 9-15 and 18 have been fully considered and are persuasive. The 112, second paragraph rejection of claims 6, 9-15 and 18 has been withdrawn.
3. Applicant's arguments with respect to claims 1-15 and 18 with respect to 102 (b) and 103 (a) rejections have been considered but are moot in view of the new ground(s) of rejection of the amended claim 1, **"each the series of pilot devices including a sub-pilot device"**.

### *Claim Objections*

4. Claims 4 and 5 are objected to because of the following informalities: the limitation "wherein it comprises" should be changed to "the combustion system comprises". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. As to claim 1, the limitation "a series of pilot devices configured to premix the fuel gas" is unclear of what is being premixed with "the fuel gas".

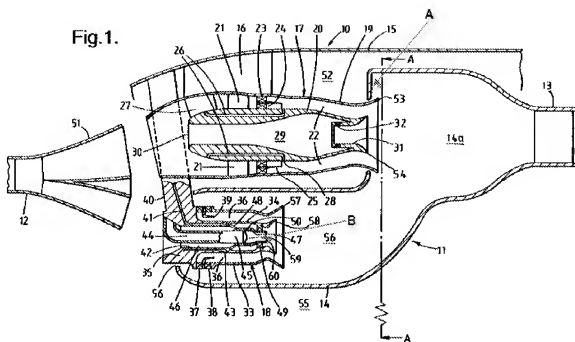
***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 6, 7-9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Richardson (US Patent No. 5,862,668).



10. As to claim 1, Richardson discloses a combustion system for a gas turbine equipped with a premixing chamber 22 (fig. 1) for [intended use] air which is mixed with the fuel injected from a series of holes 28 (fig. 1) creating a main central flame which is formed in a flame tube 14a (fig. 1), the premixing chamber is convergent toward a connected end A (fig. 1, above part of the premix chamber is convergent toward a connected end) with a combustion chamber comprising the flame tube 14a (fig. 1); and a series of pilot devices 18 (fig. 1 and fig. 2) configured to premix the fuel gas and create a series of corresponding pilot flames suitable [desired result] for stabilizing the main central flame itself [desired result], at the same time reducing the pollution emissions [desired result], each of series of pilot includes a sub-pilot device 41, 42 (fig.

1, the passages 41, 41 are considered to be a pilot sub-device, since they inject fuel to the pilot device 18) configured to inject pilot fuel gas into the respective pilot device and produce [desire result] diffusion flames for stabilizing the pilot flame.

11. As to claim 6, Richardson discloses each pilot devices 18 (fig. 1 and fig. 2) of the series of pilot devices with premixing of the fuel gas comprises a premixing duct 33 (fig. 1) a series of holes 42 (fig. 1) for the fuel gas inside the premixing duct and a unit 18 (fig. 1) comprising at least one shaped element 39 (fig. 1) so as to create turbulence [intended use] in the air flow in order to obtain [desired result] a homogenous mixture of air/fuel gas inside of the premixing chamber itself.

12. As to claim 7, Richardson discloses at least one shaped element comprises a series of shaped blades 37 (fig. 1, the swirler vanes are considered to be the shape blades).

13. As to claim 8, Richardson discloses at least one shaped element comprises two series of shaped blades 37, 38 (fig. 1).

14. As to claim 9, Richardson discloses the series of fuel gas premixing pilot devices comprises a duct 41 (fig. 1) for [intended use] the fuel gas, situated in a central elements 34 (fig. 1) inside the premixing chamber 36 (fig. 1) for [desired result] stabilizing the flame of the pilot device itself, the duct 41 (fig. 1) is inside and coaxial to an annual duct 34 (fig. 1) for [intended use] the fuel gas in turn connected to the series of holes.

15. As to claim 11, Richardson discloses the series of fuel gas premixing pilot devices comprises a mini-burner B (fig. 1 above) inside the premixing duct for [desired result] stabilization the flame of the pilot device itself.

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonciani (US Patent No. 5,660,044) in view of Richardson.

18. As to claim 1, Bonciani discloses a combustion system for a gas turbine equipped with a premixing chamber 2 (fig. 1) for air which is mixed with the fuel injected from a series of holes 15 (fig. 1) creating a main central flame which is formed in a flame tube 4 (fig. 1), the premixing chamber is convergent toward a connected end 11 (fig. 1) with a combustion chamber comprising the flame tube 4 (fig. 1).

Bonciani does not *discloses the combustion system comprises a series of pilot devices with premixing of the fuel gas which create a series of corresponding pilot flames suitable for stabilizing the main central flame it self, at the same time reducing the pollution emissions, each the series of pilot devices includes a sub-pilot device configured to inject pilot fuel gas into the respective pilot device.*

However, Richardson teaches the combustion system comprises a series of pilot devices 18 (fig. 1 and fig. 2) with premixing of the fuel gas which create a series of corresponding pilot flames suitable for stabilizing the main central flame it self, at the same time reducing the pollution emissions, each the series of pilot devices include a sub-pilot device 41, 42 (fig. 1, the passages 41, 41 are considered to be a pilot sub-device, since they inject fuel to the pilot device 18) configured to inject pilot fuel gas into the respective pilot device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Bonciani's invention to include *the combustion system comprises a series of pilot devices with premixing of the fuel gas which create a series of corresponding pilot flames suitable for stabilizing the main central flame it self, at the same time reducing the pollution emissions, each the series of pilot devices includes a sub-pilot device configured to inject pilot fuel gas into the respective pilot device*, as suggested and taught by Richardson, for the purpose of stabilizing the main flame, thereby reducing the emission gas from the combustor.

19. As to claims 2 and 3, Bonciani discloses the flame tube comprises a tapered connection end 11 (fig. 1) to the air premixing chamber 2 (fig. 1) but does not disclose that *at the tapered end comprises a series of holes each housing a respective pilot device of the series of fuel gas premixing pilot devices wherein the series of holes are positioned at an equal distance along a circumference of the tapered end of the flame tube coaxial with its axis.*



However, Richardson teaches a series of holes 57 (fig. 1, the pilot opening) each housing a respective pilot device 18 (fig. 1) of the series of fuel gas premixing pilot devices wherein the series of holes are positioned at an equal distance 18 (fig. 2) along a circumference (fig. 2) of the surface of the flame tube.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Bonciani's invention to include *a series of holes each housing a respective pilot device of the series of fuel gas premixing pilot devices wherein the series of holes are positioned at an equal distance along a circumference of the tapered end of the flame tube coaxial with its axis*, as suggested and taught by Richardson, for the purpose of stabilizing the main flame, thereby reducing the emission gas from the combustor

20. As to claim 5, Bonciani discloses a feeding duct 25 (fig. 1) of the fuel which surrounds the central body.

21. Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Goodrich (US Patent No. 6,094,904).

22. As to claims 4 and 18, Richardson discloses the each pilot device comprises two ducts 45 46 (fig. 1) but does not disclose that *a series of thermocouples outside the central body*.

However, Goodrich teaches at least one sensor such as a thermocouple for monitoring temperature inside the injector (abstract, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify

Richardson's invention to include *a series of thermocouples outside the central body*, as suggested and taught by Goodrich, for the purpose of monitoring the temperature of the pilot injector, thereby, the combustor operates more efficient.

23. Claims 10, 12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Goodrich and further in view of Carberry (Pub. No. US 20020078684).

24. As to claim 10, Richardson discloses each pilot device comprises two ducts 45, 46 (fig. 1) inside the premixing duct 36 (fig. 1) but does not disclose *two ducts for [intended use] detecting the flow rate of the fluid inside the pilot fuel device itself and at least one thermocouple*.

However, Goodrich teaches at least one sensor such as a thermocouple for [intended use] monitoring temperature inside the injector (abstract, line 6).

25. Carberry teaches air/fuel sensor 38 (fig. 1) is coupled to the duct for detecting the flow rate of fluid inside the duct.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Richardson's invention to include *two ducts for detecting the flow rate of the fluid inside the pilot fuel device itself and at least one thermocouple*, as suggested and taught by Goodrich and Carberry, for the purpose of for the purpose of monitoring the temperature and detecting the flow rate within the pilot injector, thereby, the combustor operates more efficient.

26. As to claim 12, Richardson discloses a series of holes 49, 50 (fig. 1 ) for air and the mini-burner B (fig. 1 above) is connected to a duct 44 (fig. 1) for the fuel gas inside and coaxial to an annular duct 36 (fig. 1) for the fuel gas, in turn connected to the series of holes 41 (fig. 1, the fuel passage injects fuel through the holes).

27. As to claim 14, Richardson discloses a duct 36 (fig. 1) connected to the series of external holes 37, 38 (fig. 1, the air flow from outside of the pilot housing 18 through the swirler vanes) and a duct 36 (fig. 1) connected to the series of holes 41 (fig. 1, the fuel passage injects fuel through the holes).

28. As to claim 15, Richardson discloses the each pilot device comprises two ducts 45, 46 (fig. 1) but does not disclose that *a series of thermocouples outside the central body*.

However, Goodrich teaches at least one sensor such as a thermocouple for monitoring temperature inside the injector (abstract, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Richardson's invention to include *a series of thermocouples outside the central body*, as suggested and taught by Goodrich, for the purpose of monitoring the temperature of the pilot injector, thereby, the combustor operates more efficient.

29. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson/Goodrich/Carberry and further in view of Hayashi (US Patent No. 7,143,583).

30. As to claim 13, Richardson's modified invention discloses the essential features of the claimed invention except *the pilot device comprises a series of holes outside the premixing chamber for stabilizing the flame of the pilot.*

However, Hayashi teaches a series of holes 28, 31 (fig. 1) outside the premixing chamber 22 (fig. ) for stabilizing the flame of the pilot, Therefore, it would have obvious to one of ordinary skill in the art at the time invention was made to modify Richards' invention to include *a series of holes outside the premixing chamber for stabilizing the flame of the pilot*, as suggested and taught by Hayashi, for the purpose of stabilizing the flame of the pilot.

### **Conclusion**

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHUTTHIWAT WONGWIAN whose telephone number is 571-270-5426. The examiner can normally be reached on Monday - Thursday, 7:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MICHAEL A. CUFF can be reached on 571-272-6778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. W./  
Examiner, Art Unit 3741

/Michael Cuff/  
Supervisory Patent Examiner, Art Unit 3741